
Space Weather Forecast

Issued on Tuesday, 22 August 2023 at 01:20 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Moderate class flares (R1-R2; Minor-Moderate radio blackouts). Current high speed stream (HSS) influence waning.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low with only low to mid-Common class flares observed during the period. There are currently eight sunspots on the Earth-facing side of the sun. The largest is a region that recently rotated over the eastern horizon in the northern hemisphere, though this appears to contain a fairly simple magnetic structure. A moderately sized region in the southwest has generally decayed. Meanwhile another small spot in the southwest has faded and later re-emerged, though has shown signs of decaying again in recent hours. Otherwise there was little change to the other pre-existing regions on the disc which remain generally simple and stable.

A region at the eastern limb is likely to present another sunspot group to rotate onto the visible disc on 22 August. Despite being far-sided it has been responsible for numerous flares from low to mid-Common class level in the past 48 hours and could be a notable region.

A filament (arc of plasma) eruption was observed leaving the sun around 21/1600 UTC from a region just to the northeast of a sunspot in the southwest, however, no Coronal Mass Ejection (CME) have been detected in available solar imagery. Therefore no Earth-directed CMEs have been identified during the period.

Solar Wind / Geomagnetic Activity: The solar wind at Earth has been Elevated to Strong throughout, generally between 570-650km/s at first with a peak of 680 km/s noted at 21/0935 UTC. This enhancement was due to a trans-equatorial coronal hole currently located around 60W. During the second half of the UTC day on 21 August, the solar wind weakened to fall to persistently Elevated levels (between 510-550km/s) by the end of the period as the high-speed stream began to ease. The associated magnetic field carried by the solar wind was Weak. The important north-south component varied between Weakly positive and Weakly negative. The net result of the above solar wind measures was for Quiet to Unsettled geomagnetic activity (Kp1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar Activity is expected to be Low, but with a Chance of isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: Solar winds are currently Elevated due to the connection to a trans-equatorial coronal hole in the western hemisphere. The connection to this feature expected to ease in the next couple of days Slightly Elevated levels before the arrival of another coronal hole high-speed stream (HSS) on Day 2 (23 August) likely increases speeds to more persistently Elevated levels once again. This feature then probably eases on Day 3 and 4 (24 and 25 August). No Earth-directed CMEs feature in the forecast.

Geomagnetic activity is forecast to be mostly Quiet to Unsettled (Kp1-3), but on Day 2 there is the Chance for isolated Active periods and a non-zero risk of a G1/Minor Storm interval.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)